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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/718,549	11/24/2003	Shinji Ohuchi	OKI.136D3	1262
20987	7590	06/16/2005	EXAMINER	
VOLENTINE FRANCOS, & WHITT PLLC ONE FREEDOM SQUARE 11951 FREEDOM DRIVE SUITE 1260 RESTON, VA 20190			PERALTA, GINETTE	
			ART UNIT	PAPER NUMBER
			2814	

DATE MAILED: 06/16/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

AK

Office Action Summary	Application No. 10/718,549	Applicant(s) OHUCHI ET AL.	
	Examiner Ginette Peralta	Art Unit 2814	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 10-17 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 10-17 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on ____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☒ Certified copies of the priority documents have been received in Application No. 09/460,987.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date <u>11/24/03</u> . | 6) <input type="checkbox"/> Other: ____ |

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claim ~~10~~ ^{is 10-17 ave} rejected under 35 U.S.C. 103(a) as being unpatentable over Capote et al. (U. S. Pat. 6,297,560 B1) in view of Riding et al. (U. S. Pat. 6,083,811).

Regarding claim 10, Capote et al. discloses a method of mounting a semiconductor device on a mounting substrate that comprises providing the semiconductor device as including a semiconductor element 10, a sealing resin (22 or 37), and a plurality of terminals 14; the semiconductor element having a thickness, a first surface wherein circuitry 24 is formed, a second surface, and side surfaces positioned between the first and second surfaces, the sealing resin (22, 37) having a thickness between about 50 microns and 200 microns (as disclosed in col. 6, lines 40-41) so that the second and side surfaces are not sealed by the sealing resin (22, 37), each of the plurality of terminals 14 being electrically connected to the circuitry 24; putting the semiconductor device on a mounting substrate 20, so that the first surface of the semiconductor device faces the mounting substrate; and fixing the semiconductor

device on the mounting substrate 20 by a heat treatment (as disclosed in col. 7, lines 1-16).

Capote et al. discloses the claimed invention with the exception of disclosing the thickness of the semiconductor element, and the thickness of the sealing resin in relation to the thickness of the semiconductor element.

Riding et al. discloses a method of mounting a semiconductor device on a mounting substrate that comprises providing a semiconductor device 12 as including a semiconductor element 20 and a sealing resin 22 (as disclosed in col. 4, lines 1-29); the semiconductor element having a thickness of $200\text{ }\mu$ or less (as disclosed in col. 4, lines 10-12, wherein the dice has a thickness of 4 mils $\approx 102\mu$), a first surface wherein circuitry is formed, a second surface, and side surfaces positioned between the first and second surfaces, the sealing resin not sealing the second and side surfaces; putting the semiconductor device 12 on a mounting substrate 22, so that the first surface of the semiconductor device faces the mounting substrate, wherein the thickness of the semiconductor element being $200\text{ }\mu$ or less is taught for the well known and intended purpose of teaching the miniaturization which is ever occurring in the semiconductor devices and manufacturing field, and thus shows that using a semiconductor element of $200\text{ }\mu$ or less would be within the scope of one of ordinary skill in the art.

Thus, it would have been obvious to one of ordinary skill in the art at the time the invention was made that the semiconductor element of Capote et al. could have a thickness of $200\text{ }\mu$ or less, and furthermore that since Capote et al. discloses that the

thickness of the sealing resin ranges from 50 to 200 μ , that the sealing resin could have a thickness equal to or greater than half a thickness of the semiconductor element.

Furthermore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a semiconductor element having any desired thickness as there is no statement denoting the criticality of the semiconductor element thickness.

"In the case where the claimed ranges "overlap or lie inside ranges disclosed by the prior art" a prima facie case of obviousness exists. In re Wertheim, 541 F.2d 257, 191 USPQ 90 (CCPA 1976); In re Woodruff, 919 F.2d 1575, 16 USPQ2d 1934 (Fed. Cir. 1990) (The prior art taught carbon monoxide concentrations of "about 1-5%" while the claim was limited to "more than 5%." The court held that "about 1-5%" allowed for concentrations slightly above 5% thus the ranges overlapped.)" (MPEP 2144.04)

Regarding claim 11, Capote et al. discloses that the semiconductor element has a central portion and a peripheral portion surrounding the central portion, the peripheral portion having a step part, wherein a thickness of the sealing resin (22, 37) on the step part is greater than a thickness of the sealing resin on the central portion.

Regarding claims 12, and 13, Capote et al. discloses that the mounting substrate may be a printing board (as disclosed in col. 1, lines 63-67).

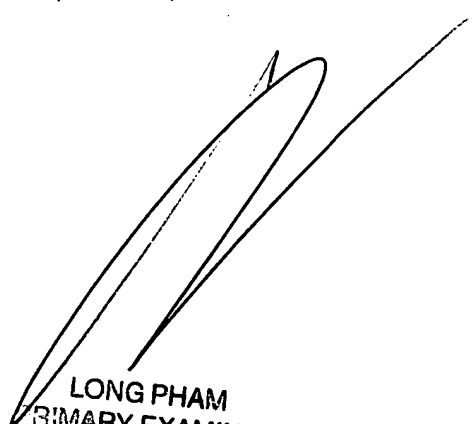
Regarding claims 14, 15, 16, and 17, Capote et al. discloses that the plurality of terminals are solder balls 14, the heat treatment comprises reflow of solder balls 14.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ginette Peralta whose telephone number is (571) 272-1713. The examiner can normally be reached on Monday to Friday 8:00 AM- 5:30 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Wael Fahmy can be reached on (571) 272-1705. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

GP



LONG PHAM
PRIMARY EXAMINER